

# ON A VERY REMARKABLE FLEA FROM ARGENTINA COLLECTED BY DR. J. M. DE LA BARRERA

By H. E. KARL JORDAN

(Tring, Herts)

With 5 text-figures

The rapid increase of our knowledge of the Flea fauna of the Republic of Argentina during recent years is due to Dr. J. M. de la Barrera, Director of the Institute of Hygiene at Buenos Aires, and we students of Siphonaptera in the Tring Department of the British Museum (Natural History) are profoundly grateful to him for the invaluable collections submitted to the British Museum (Nat. Hist.) for study and report. The latest collection, received in the autumn of 1952, contained, *inter alia*, a number of interesting species from Bariloche, Nahuel Huapi, Rio Negro, where Dr. de la Barrera has a summer residence. Among these fleas is a species which excels in interest every other new one Dr. de la Barrera has previously discovered. When the specimens were cleared and mounted the very conspicuous and quite unexpected kind of distinction of this species took my breath away, and my two colleagues reacted in the same way: *incredible!* The Incredible Flea is the subject of this paper. A new species, new genus, new tribe. I name the genus *Barreropsylla* in appreciation of the great services Dr. de la Barrera has rendered and is continuing to render to the study of Fleas, an order of parasites so closely linked to his researches on the diseases of the wild mammals of his country. I expect that students of Siphonaptera will be as astonished at the somewhat spectacular distinctions of the species as we were, and that the extraordinarily wide gap, in some somatics, between *Barreropsylla excelsa* and the related species will arouse interest beyond the sphere of Siphonapterology. A short survey of the main characteristics will be sufficient to prove that the species provides an ample field of meditation for the taxonomist and geneticist. In evaluating the characteristics of *B. excelsa* we must bear in mind that the species, apart from its special features, is an American Stephanocircid fitting well into the subfamily of *Craneopsyllinae*; there is no doubt about that. Confining the discussion, for the sake of brevity, to four of the obvious distinguishing features of *B. excelsa*, we can group them into two phylogenetically contrasting categories:

(a) Characters ancestral for the *Stephanocircidae* and (b) characters highly specialized. The first category is exemplified in the postantennal section of the head (usually termed occiput in our writings on fleas) (Fig. 3): the dorsal margin is medianly somewhat rounded dilated (*dt*); this is an early step in the evolution of a sclerotized band which extends some distance down the side in all other species of the family, *Cleopsylla* Rothschild, 1914, taking an intermediate position. Similarly primitive

are the arrangement and number of the setae on the occiput : they form three rows, in which *Barreropsylla* agrees with many fleas outside the family, but differs from the known species of *Stephanocircidae*, there being four rows in *Cleopsylla* and five or six in the other genera (for *Cleopsylla* see F. Smit's paper on fleas in this issue of the *Bulletin*, Figs. 13, 14). Category (b) is represented by the modifications of the genal comb and the pronotum : whereas the known species of helmet fleas have a genal comb of four or more spines (sometimes much shortened), we find in *Barreropsylla* at the genal edge one to three dark knobs (*Gc*), which I interpret as being the remnants of a three-spined ancestral comb ; an advance in evolution by reduction which is no rarity in fleas. The modification of the pronotum is an extreme and probably not surpassed by any other flea existing ; it transcends the pronotal

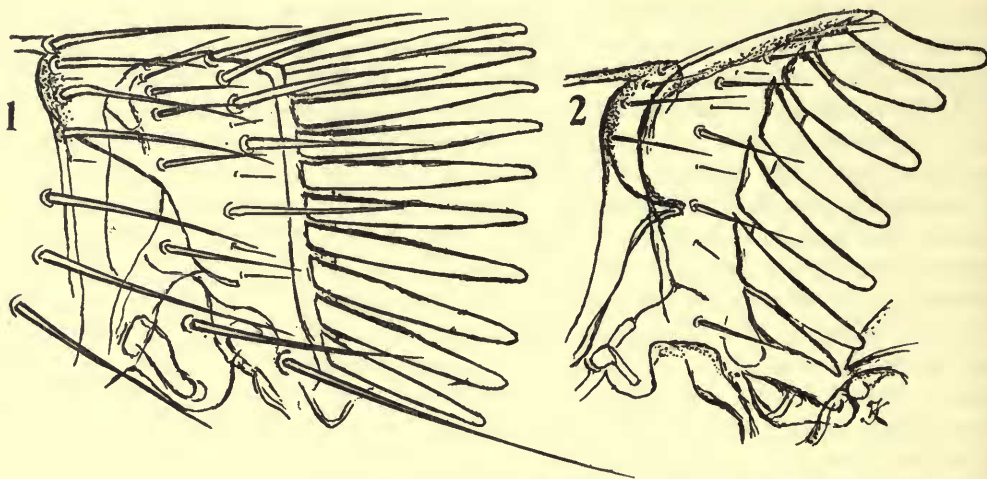


FIG. 1.—Pronotum of *Nonnapsylla rothschildi* Wagn., 1938, ♀ from Peru.

FIG. 2. Pronotum of *Meringis altipecten* Traub & Hoff, 1951, ♂ from New Mexico.

development of all fleas. The dorsal area is drawn out into a long process which reaches to the end of the mesonotum and bears a comb, the spines of which project downward. It is a feature which would seem to be more appropriate for a species of *Membracidae* than for a flea. In order to make it easier to understand what has happened to the pronotum of *Barreropsylla* we figure the pronotum of two other fleas (Figs. 1 and 2) for comparison. In contrast with the new genus the helmet fleas have a vertical pronotal comb more or less similar to that of *Nonnapsylla* Wagn. 1938 (Fig. 1) ; in no species of the family is there an indication of a development in the direction of the *Barreropsylla* pronotum. In other groups of fleas, however, species occur in which the pronotum is dorsally somewhat widened backwards, the comb being curved ; and a small number of species are now known in which the posterior margin is longer than the anterior one, the projecting posterior angle being raised well above the mesonotum (Fig. 2 ; see also figs. 54, 55 in F. Smit's paper). Comparing Fig. 3 with Fig. 1 it is evident that the development of

the mantilla has had various effects on the pronotum, one of them being a considerable reduction in its extension downwards. The true occiput, which lies partly within the pronotum, seems likewise to be affected; the line which represents its upper surface in a lateral aspect is broader than usual, looking like a rod emanating from the subapical vertical sclerotized ridge; its apex touches the inner side of the pronotal exoskeleton and is surrounded by a pale halo (*dap*), which give one the impression of being a condylus and socket—a very interesting point. However, the detail is too much obscured in both specimens and the observation requires confirmation by further material.

Though we see what has happened to the pronotum, we have no evidence of how and why the mantilla has come into existence. Nevertheless, the wide difference between the usual pronotum of a helmet flea (Fig. 1) and that of *Barreropsylla* (Fig. 3) and the occurrence here and there among other fleas of a pronotum like Fig. 2 suggest an evolution by stages. It is therefore reasonable to assume that intermediate stages have existed and perhaps one or the other of them still exists, which gives us hope that Dr. J. M. de la Barrera will discover the missing link or links. Meanwhile the new flea has to be described and its proper position in the *Craneopsyllinae* to be ascertained.

The distinctions of *Barreropsylla* being a mixture of primitive somatics, which put the genus at the bottom of the phylogenetic tree of the family, and very highly specialized ones, which place it at the top, it is obvious that the flea followed its own line of evolution and represents a tribe which branched off below the other branches.

### ***Barreropsyllini* tribus nova Craneopsyllinarum**

Dorsal margin of occiput with a short downward widening in middle. Pronotum dorsally produced backwards into a process which bears a comb each side; no vertical pronotal comb. This diagnosis is kept short as it may possibly have to cover in future one or several less strongly modified species.

### ***Barreropsylla* gen. nov.**

(Fig. 3)

♂♀. Spines of comb of helmet long, except the first (uppermost), which is reduced in length and width, the ventral spine being the longest; anterior area of helmet narrow, with short incrassations, many of which are obtuse, and with a row of small and rather indistinct bristles; upper third of this area without incrassations; ventrally the area projects down as a nose which is about as long as the base of the ventral spine is broad (in ♂ the nose broken away). Helmet not distinctly separated from genal area, but there is below the spines of the comb a pale stripe from the apex of the second spine downwards; at the posterior side of this stripe there are numerous small bristles, and from its anterior side some narrow, apically rounded-dilated sclerotized streaks extend obliquely across it in an upward direction. Maxilla rounded-truncate, not pointed. Occiput with only three rows of bristles and a





FIG. 3. Head and thorax of *Barrotopsyla excelsa* gen. & spec. nov., ♂.

single long bristle between second and third row. In the only known species the pronotal mantilla (or hood) on each side with a comb of ten spines, which gradually become shorter, the last one being little longer than broad.

Type: *Barreropsylla excelsa* sp. nov.

***Barreropsylla excelsa* sp. nov.**

(Figs. 3, 4, 5)

♂♀. Comb of helmet with 8 spines (as in *Cleopsylla townsendi* Roths., 1914), lowest spine (measured from the upper basal angle) one-half longer than the second spine from above, basal margins of spines more or less deeply sinuate. Much behind pharynx and close to the sclerotized anterior margin of the antennal fossa one long bristle, in front of which appears a short branch of the tentorium; no second long bristle between helmet and antennal fossa, but several small ones; the small spoon-like sclerotizations under the spines of the helmet number 6 or 7. Remnants of genal comb (Gc): on left side of head of ♂ a knob at lower angle of genal margin (Fig. 3), on right side a row of 3, in ♀ 3 on both sides. Segment I of antenna nearly straight, a little more than one-half longer than broad, II with a row of 5 or 6 bristles, of which in ♂ some (4?) reach beyond middle of club, whereas in ♀ 5 extend to apex of club or a little beyond it. The widening of the middle of the dorsal margin of the occiput is not distinctly more sclerotized than the rest of the margin, and there are no indications of other tubers; the anterior row of occiput contains 2 bristles in ♂ and 3 in ♀, the second and third rows in ♂ and ♀ 5 each side, the second row being continued dorsally by one or two much smaller bristles. The labial palp has 5 segments and reaches to the trochanter (♂) or nearly (♀), being much longer than the maxillary palp. Pronotum with 2 rows of bristles, the posterior row containing 10 long ones on the two sides together. For bristles of meso- and metanotum see Fig. 3. Pale central area of metepisternum twice as long as broad; on metepimere 2 rows of bristles, in ♂ containing 6, 5 on one side and 5, 4 on the other, in ♀ 6, 6 and 6, 4, besides a long bristle at apical margin in ♂ and ♀. Abdominal tergites likewise with 2 rows, the numbers of bristles being on III and IV in ♂ and ♀ 13 or 14, 17 or 18 (the two sides together), on V in ♂ 4, 17, in ♀ 4, 15, on VI in ♂ 4, 11, in ♀ 1, 12, on VII in ♂ 0, 10, in ♀ 5, 6. Antepygial bristles long and stout, in ♂ 1 each side, in ♀ 2 equal in length. Basal abdominal sternum with a pair of ventral marginal bristles, sterna III to VI with a single row, numbering (the two sides together) in ♂ on III 10, IV 9, V 8, VI 7, in ♀ on III 11, IV to VI 8 each.

Femora, on outer surface, with a few lateral bristles in apical third and 1 to 3 further forward, besides the usual ventral bristles near base and apex; on inner surface only the ventral subapical one, no lateral ones; on outer side of fore-, mid- and hind-tibiae a row of lateral bristles numbering respectively, in ♂ 6, 7, 9 or 10, and in ♀ 7, 10 or 11, and 12; the bristles at the dorsal margin and close to it counted from the base to the middle of the apical margin number the same in ♂ and ♀; in fore-tibia 19 and in mid- and hind-tibia 22 ( $\pm 1$ ); the row of bristles at the apical margin is interrupted in all three tibiae, not forming a comb.

Terminalia. ♂. (Fig. 4). As VII.t. is totally and VIII.t. partially telescoped into VI.t., it is not possible to determine accurately the outline of each segment and to recognize the homology of every sclerite. In front of the antepygidial bristle lies a narrow curved sclerite which bears on the convex anterior side a row of rounded

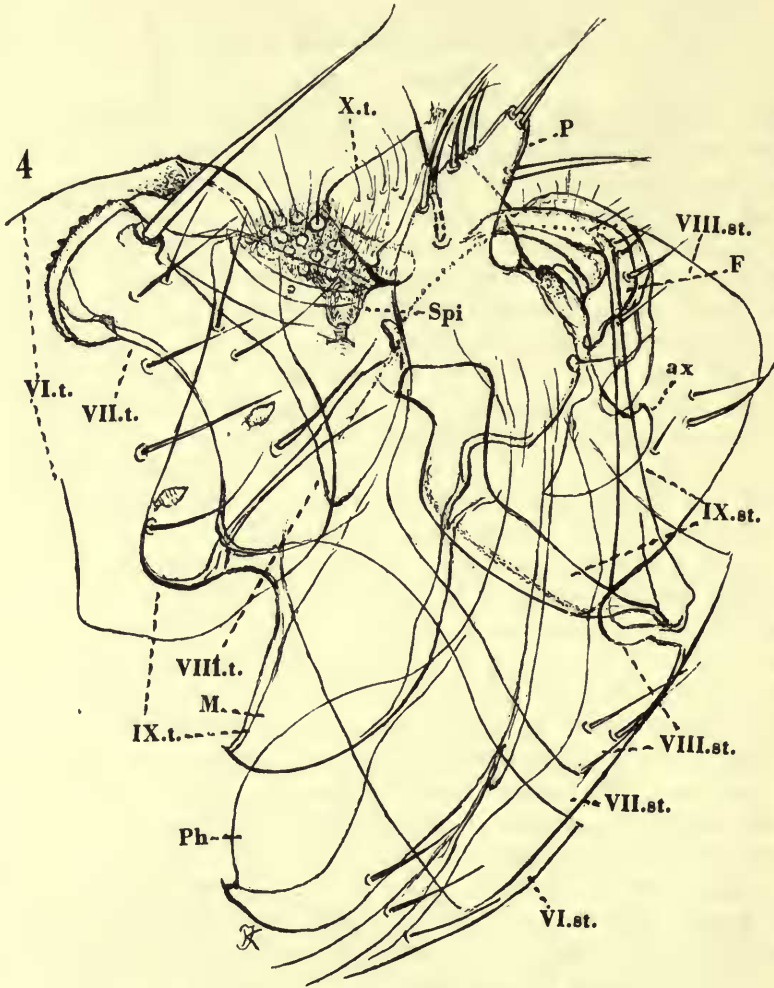


FIG. 4. *Barreropsylla excelsa*, terminalia of ♂.

humps; it has evidently been shifted from its proper place; it may be a part of VII.t. or it may not. When a second ♂ becomes available for comparison the nature of this conspicuous sclerite may become clear. The margin of VIII.t. runs across the sensillum and in consequence the shape of the spiracle (*Spi*) is obscured. VIII.st. bears only three bristles each side, two of them small, the third fairly large; the extension dorsal of VIII.st. is not clear at all, and the dotted line to indicate this extension may be in the wrong place; IX.t. is much longer than broad; it is anteri-

only produced into two broad apodemes ; the lower one is the manubrium (*M*), the upper margin of which (anterior margin in figure) is nearly straight and not much longer than the manubrium is broad at the base ; ventral margin evenly convex. The sinus above the manubrium round and the apodeme above it almost the inverse of it. The clasper (*Cl*) ends with a conical process (*P*), which is about twice as long as broad and bears a row of three stout and two slender bristles at the anterior (or dorsal) margin, two bristles at the apex and two at the posterior side, there being

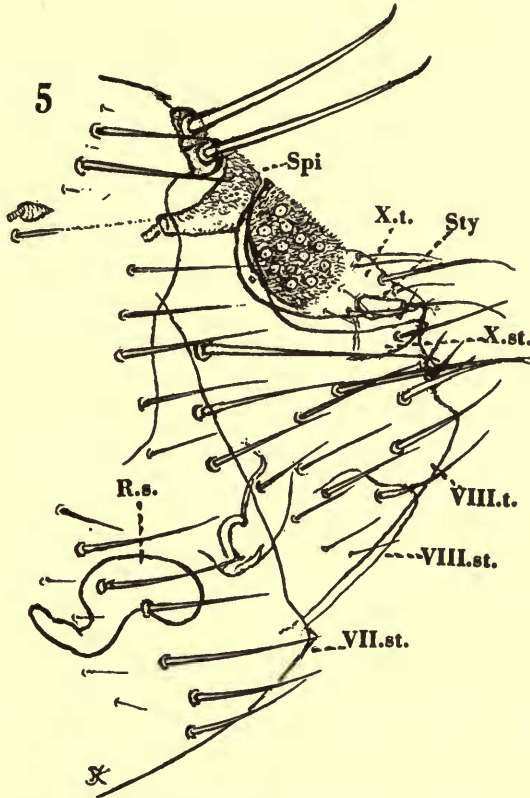


FIG. 5. *Barreropsylla excelsa*, terminalia of ♀.

in addition a long one on the inside at the base of the process. Below *P* and forming with it a round sinus there is a narrow, almost spine-like projection, which may possibly not belong to the clasper ; it is placed close to the clasper's sclerotized swelling, which bears the movable digitoid *F*. This is claw-like, narrow, curved towards *P* and pointed and bears a submarginal row of 4 bristles, of which the lowest is the stoutest ; then follow on the margin of *F* 6 very thin ones (some quite short) and at some distance from apex a long one about the thickness of the third of the submarginal row but longer. The upper end of the anterior arm of IX.st. is curved backwards as shown in Fig. 4 ; the posterior arm is straight, broadest at the



base, gradually narrowed, the apical half being about as broad as the basal fourth of the antepygial bristle and bearing two slender bristles. X.t. triangular in lateral aspect, with an oblique row of thin bristles on the side and several more bristles further forward, the base partially overlapped by the sensillum. Most of the distal sclerites of the phallosome (*Ph*) are hidden and not indicated in Fig. 4; the proximal portion is bulbiform and more convex dorsally than ventrally. Some distance proximally of the digitoid *F* lies, each side of body, a sclerite which resembles the blade of a woodcutter's axe (*ax*) and is conspicuous by its shape; it is evidently a part of the phallosome.

♀. (Fig. 5.) VII.t. with 13 bristles in a row and in front of them 8 small ones (on the two sides together); its apical margin nearly straight. Cavity of spiracle (*Sp*i) of VIII.t. curved upwards, being a little more than twice as long as broad; from the spiracle downwards there are 19 bristles on the left side and 14 on the right, the upper bristle of the second row being the largest; on the inside of the apical margin there is a cluster of 3 short and stiff bristles and none further down. X.t. bears 7 bristles each side, the dorsal median one being larger than the apical bristle of the stylet (*Sty*); X.st. is evenly convex below, and has a small bristle at the upper margin and a long one near the lower part of the apical margin. Stylet about three times as long as broad. The spermatheca (*R.s.*) resembles that of *Tiarapsylla titschacki* Wagn., 1937, its orifice being ventral.

Length ♂ 2.2 mm., ♀ 2.5 mm.

One pair from the Republic of Argentina: collected by Dr. J. M. de la Barrera at Bariloche, Nahuel Huapi, Rio Negro, 780 mm., 3 vii. 1952, on *Akodon* sp., type ♂. In the coll. of the British Museum (Nat. Hist.).